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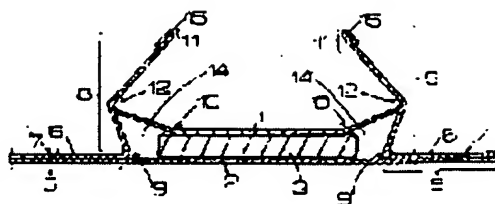
(72)Inventor : MIYATA KEIKO  
TSUBATA MASARU

## (54) DISPOSABLE DIAPER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a disposable diaper, which prevents permeation and leakage of excreta, by preventing collapse of cubic gathers.

SOLUTION: A part positioned in an absorbent body 3 side of a side sheet 6 is branched at a side flap 5 to form a stereoscopic gather(s) 8, a stretchable elastic body 15 is set in a stretched condition on the side edge along the longitudinal direction to form a free edge 11 and is folded on the side flap 5 so that a part between the branch point and the free edge is positioned outer than the branch part and the free edge, the both end parts in the longitudinal direction are adhered and fixed to form the folded part, and, further, the surface sheet is extended outward from the both side edges of the absorbent body in the longitudinal direction, and the side edge part is joined to the folded part 12 of the stereoscopic gather 8. Thereby, when a diaper is put on, the stereoscopic gather 8 in a chevron shape standing on the branch point on the side flap 5 as the first base end part and the adhering part with the absorbent body on the surface sheet as the second base end part in the diaper crotch area so that the folded part is positioned outer than the first base end part and the free edge is formed.



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## CLAIMS

[Claim(s)]

[Claim 1] The surface sheet of liquid permeability, the rear-face sheet of liquid impermeability, and the absorber arranged among both [ these ] sheets. In the usage \*\*\*\* diaper which has the side flap which extends outside from the longitudinal direction edges on both sides of an absorber, and the solid gathers currently formed near the edges on both sides of an absorber said side flap The part which extends outside from the longitudinal direction edges on both sides of the absorber of said rear-face sheet, Between the rear-face sheet which is formed of the sideseat by which the laminating was carried out on it, and forms a side flap further, and the sideseat, the elasticity elastic body is arranged in the state of expanding. The part located in the absorber side of said sideseat branches from a side flap, and said solid gathers are formed. An elasticity elastic body is arranged in the state of expanding by the side edge in alignment with the longitudinal direction, and a free edge is formed. And it is folded up on a side flap so that the part between the branch point and a free edge may be located the branch point and outside a free edge. Adhesion immobilization is carried out, longitudinal direction both ends fold up, the section is formed, further, said surface sheet extends outside from the longitudinal direction edges on both sides of an absorber, and the side edge section is joined to the folding section of solid gathers. By this At the time of diaper wear, said solid gathers are set to the length-from-the-crotch-to-the-cuff field of a diaper. The usage \*\*\*\* diaper which uses a part for jointing of the first set edge, a surface sheet, and an absorber as the second set edge for the branch point on a side flap, and is characterized by having bent to the typeface of \*\* and having stood up up so that said folding section may be located outside the first set edge and a free edge.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the usage \*\*\*\* diaper which leakage prevention and solid gathers fall and has effectiveness in prevention about a usage \*\*\*\* diaper.

[0002]

[Description of the Prior Art] The usage \*\*\*\* diaper has composition which has arranged the absorber which consists of hydrophilic sheet, curdy pulp, and super-absorbent polymer matter etc. between the surface sheet of liquid permeability, and the rear-face sheet of liquid impermeability. Since it comes to use the super-absorbent polymer matter into the absorber of a disposable diaper in recent years, greatest effectiveness will be raised to urinary leakage, reversion, etc. However, the super-absorbent polymer matter may leak, when urine, a loose passage, etc. are excreted temporarily, since urinary rate of absorption is extremely slow compared with curdy pulp. For this reason, a cure which does not leak to a lot of urine or loose passages is needed.

[0003] In order to solve these points, arranging solid gathers on the outside of an absorber has been proposed. That is, the solid gathers which have a side flap containing an elasticity elastic body in JP,6-93901,B, and function on it as the leakproof section are pushed down and installed inside a diaper including an elasticity elastic body, the pocket section is formed between the surface sheets on an absorber, and the diaper which measured leakage prevention is known. However, since solid gathers have broken down only from solid gathers having been simply moved to the absorber inside at the time of wearing, without standing up to an absorber side, the role of the anti-leak barrier to urine or a loose passage may be unable to be played by it. Moreover, since it fell in the direction of the inside and has stood up in feeling, even if it has stood up with sufficient fate, when the capacity of the pocket section decreases and a lot of urine is excreted, it will leak to the outside of a diaper, without urine being temporarily securable. Moreover, in order to enlarge capacity, when solid gathers width of face was made large, there was a trouble that wrap area became [ solid gathers ] large about an absorber, and an absorption field became extremely narrow.

[0004] Moreover, barrier cuffs were made to fix the both-sides section of a surface sheet to JP,2-271863,A. and the diaper which forms the absorption pocket space of a loose passage with barrier cuffs, a surface sheet, and an absorption element is proposed to it. In order to make the space formed with barrier cuffs, a surface sheet, and an absorption element, it is required to approach an absorber and to install barrier cuffs, and a pocket with a big capacity cannot be made. Moreover, the example constituted so that the inside of absorption pocket space may be covered with a surface sheet is indicated by making the flank of a surface sheet extend, making a flank meet the inside of a barrier sheet, turning up further and making the top face of an absorber meet in the example shown in the official report. However, generally, even if there is a property of a surface sheet, since there are few absorbed amounts; wettability absorbs neither a loose passage nor urine, and it is meaningless [ wettability ].

[0005] Moreover, in the diaper which has the barrier cuffs of an inner derrick down substantially, on the side flap, another juxtaposition edge is located on an absorber and, as for one juxtaposition edge, the diaper with which two juxtaposition edges and one distal end serve as barrier cuffs with which the scalene triangle was formed and the top-most vertices were located in the method of inside from the core in the state of standing up is indicated by JP,4-295356,A. However, since the barrier cuffs of the inside which has extended from an absorber have stood up inside, it not only cannot make a pocket with a big capacity, but wrap area becomes [ barrier cuffs ] large about an absorber, and leakage occurs.

[0006]

[Problem(s) to be Solved by the Invention] The solid gathers in which this invention person etc. was formed of the sideseat in view of this present condition stand up in the direction of an end outside. Furthermore, stand up in the direction of the inside from a line by return, and the side edge section of a surface sheet extends further. And by being joined to solid gathers, solid gathers fall, and it is prevention and a stain that space is formed in the lower part of solid gathers, and it resulted in the conclusion that effectiveness is in leakage prevention. That is, by folding up and installing solid gathers in the typeface of \*\*, it becomes possible to form the pocket structure where capacity is large, without checking the absorption field on an absorber, and greatest effectiveness can be raised to leakage prevention. Moreover, in order to be the stain of excrement and effectiveness goes up to prevention, since space is formed with the sheet of two sheets with which the solid gathers lower parts differ, and also to prevent \*\*\*\* of solid gathers and to stand up into the character of \*\* exactly from the end face section, a leakproof effect is demonstrated further. Solid gathers fall and the purpose of this invention is to offer the usage \*\*\*\* diaper which are prevention, and leakage and a stain and has effectiveness in prevention.

[0007]

[Means for Solving the Problem] Namely, the surface sheet of liquid permeability [ this invention ] and the rear-face sheet of liquid impermeability. In the usage \*\*\*\* diaper which has the absorber arranged among both [ these ] sheets, the side flap which extends outside from the longitudinal direction edges on both sides of an absorber, and the solid gathers currently formed near the edges on both sides of an absorber The part into which said side flap extends outside from the longitudinal direction edges on both sides of the absorber of said rear-face sheet. Between the rear-face sheet which is formed of the sideseat by which the laminating was carried out on it, and forms a side flap further, and the sideseat, the elasticity elastic body is arranged in the state of expanding. The part located in the absorber side of said sideseat branches from a side flap, and said solid gathers are formed. An elasticity elastic body is arranged in the state of expanding by the side edge in alignment with the longitudinal direction, and a free edge is formed. And it is folded up on a side flap so that the part between

the branch point and a free edge may be located the branch point and outside a free edge. Adhesion immobilization is carried out. longitudinal direction both ends fold up, the section is formed, further, said surface sheet extends outside from the longitudinal direction edges on both sides of an absorber. and the side edge section is joined to the folding section of solid gathers. By this At the time of diaper wear, said solid gathers are set to the length-from-the-crotch-to-the-cuff field of a diaper. Using a part for jointing of the first set edge, a surface sheet, and an absorber as the second set edge for the branch point on a side flap, it consists in the usage \*\*\*\* diaper characterized by having bent to the typeface of \*\* and having stood up up so that said folding section may be located outside the first set edge and a free edge.

[0008]

[Embodiment of the Invention] In the usage \*\*\*\* diaper of this invention of the above-mentioned configuration, the side flap on which the sideseat and the rear-face sheet were stuck is adjoined. The first set edge which a sideseat extends inside, and the solid gathers currently furthermore formed near the edges on both sides of an absorber are formed, and branches from a side flap further. It is located inside the first set edge and has the folding section formed between the free edge bent by \*\*\*\*ing an elasticity elastic body inside at the time of \*\*, and the first set edge and a free edge. While a surface sheet is joined to the absorber top section and the second set edge is formed, the side edge section of a surface sheet is joined to the folding section of solid gathers. Furthermore, solid gathers are folded up from the end face section, and it extends in the direction of an outside between the sections, folds up further, and has composition which has extended in the direction of the inside between the section and a free edge. The solid gathers of these configurations are once standing up in the direction of an outside, folding up further and standing up in the direction of the inside from the section according to the shrinkage force of the elasticity elastic body attached in the free edge in the length-from-the-crotch-to-the-cuff section field, form a pocket with a large capacity and have structure excellent in leakage prevention. Moreover, when the sheet of two sheets near the lower part of solid gathers makes space, solid gathers fall, it is a stain effectiveness is not only in prevention, but, and greatest effectiveness can be raised also to prevention or leakage prevention.

[0009]

[Example] Hereafter, although a drawing explains this invention to a detail more, this invention is not limited to these. drawing 1 -- some usage \*\*\*\* diapers of this invention -- a notching Fig. is shown and drawing 2 shows the expansion perspective view of the usage \*\*\*\* diaper of this invention. Drawing 3 shows drawing 1 and the X-X' line sectional view in drawing 2, i.e., the sectional view of the length-from-the-crotch-to-the-cuff part of a diaper, and shows the example in which solid gathers are formed by the sideseat. Drawing 4 shows the example of a drawing 1 and the Y-Y' line sectional view in drawing 2, i.e., the sectional view of the vertical opposite edge of a diaper.

[0010] Moreover, the surface sheet of liquid permeability [ sign / 1 ] (it may be called a surface sheet below). The rear-face sheet of liquid impermeability [ 2 ] (it may be called a rear-face sheet below). In 3, an absorber and 4 a side flap and 6 for a tape fastener and 5 A sideseat, 7 -- the circumference elasticity elastic body of a foot, and 8 -- solid gathers and 9 -- the first set edge and 10 -- in the second set edge and 11, a lengthwise direction both-ends field and 14 show the space of solid gathers, and, as for a free edge and 12, 15 shows the solid gathers elasticity elastic body, as for the fold-up section and 13.

[0011] The usage \*\*\*\* diaper of this invention has an absorber 3 the surface sheet 1 of liquid permeability, the rear-face sheet 2 of liquid impermeability, and in the meantime, as shown in drawing 1. A zipper tape 4 is attached in the longitudinal direction edges on both sides of the absorber 3 of a backside, and it is used at the time of wear. The nonwoven fabric of liquid permeability with which the surface sheet 1 consists of polyester, polypropylene, etc., textile fabrics, porous plastic film, porous form, reticulated form, etc. are used. Moreover, natural fibers (for example, woody fiber, curdy fiber, etc.) are sufficient, and it can manufacture from the ingredient of large range, such as combination of a synthetic fiber and a natural fiber. Anyway, since the surface sheet 1 is a part in contact with the direct skin, it is soft and its touch should be just good.

[0012] The rear-face sheet 2 consists of the material which sticks a nonwoven fabric, textile fabrics, etc. on liquid impermeable films, such as polyethylene, and the film of liquid impermeability and a nonwoven fabric with leakproofness, textile fabrics, etc., there is especially no limit and the moisture in an absorber should not just ooze out on the diaper outside. Moreover, in order to give a blanket-like appearance, embossing processing may be carried out at the shape of a pattern, or lusterless finishing may be carried out further. Moreover, when using a film, though it is impermeability, it is still more desirable from using the well-known breathable film which makes only a steam penetrate, and preventing MURE.

[0013] Although it is inserted between the surface sheet 1 and the rear-face sheet 2 and mainly consists of curdy pulp and super-absorbent polymer matter etc., an absorber 3 is not restricted especially, and absorptivity sponge, an absorptivity sheet, etc. are sufficient as it, and it should just have the property of absorptivity. The curdy pulp in this invention makes the sheet of chemical pulp, mechanical pulp, or chemical machinery pulp the shape of cotton with a grinder. As a pulp raw material, not only a needle-leaf tree but a broad-leaved tree, straw, a bamboo, a bagasse, etc. are applied. Moreover, a synthetic fiber, a heat welding component, adhesives, etc. may be contained with curdy pulp.

[0014] As super-absorbent polymer matter, a starch polymer, an acrylic-acid system polymer, a cellulose system, etc. absorb the water of 50 times or more of a self-weight, and the thing of polyacrylic acid systems, such as sodium polyacrylate, is the most suitable for them from the point of absorptivity ability. Moreover, in the shape of fibrous, a grain, and a sheet etc., especially a limit does not have a configuration, either. The super-absorbent polymer matter may be mixed with curdy pulp, and said absorber is stratified between curdy pulp, may be sprinkled, and may be the both.

[0015] The configurations of said absorber 3 should just be configurations in which there is especially no limit and length from the crotch to the cuff is fitted, such as a sandglass mold, a \*\* type, and a T character mold. In order to raise a feeling of wear generally, it is desirable that it is the configuration which narrowed the length-from-the-crotch-to-the-cuff sections, such as a sandglass mold and a T character mold. Moreover, the absorber 3 may be covered with the hydrophilic sheet and the hydrophilic sheet may be put into the absorber 3. As a hydrophilic sheet, water absorption paper, a hydrophilic nonwoven fabric, etc. should just be the sheets of a hydrophilic property, for example.

[0016] As shown in drawing 2, drawing 3, and drawing 4, the structure of the usage \*\*\*\* diaper of this invention has an absorber 3 the surface sheet 1, the rear-face sheet 2, and in the meantime, and has the side flap 5 which extended outside from the longitudinal direction edges on both sides of an absorber 3. In this case, the rear-face sheet 2 and a sideseat 6 stick the side flap 5, it is put together, and is constituted. The sideseats 6 of this invention may be the surface sheet 1 and allotropy material, and even if they are different materials, they are not cared about. Moreover, to serve also also as a sideseat 6, the sheet of one sheet is sufficient as the surface sheet 1, and it may consist of respectively separate sheets of two sheets. However, as for the surface sheet 1 arranged on absorber 3 field, it is desirable that it is a

hydrophilic property so that urine may be absorbed promptly to an absorber 3, and as for a sideseat 6, it is still more desirable [ the sheet ] that it is water repellence as urine etc. does not ooze out from an absorber 3.

[0017] The circumference elasticity elastic body 7 of a foot is arranged between the sideseat 6 and the rear-face sheet 2, and the gathers of the circumference of a foot are formed in the lengthwise direction on side flap 5 field. As a circumference elasticity elastic body 7 of a foot, although an elastomer film, a polyurethane film, elastomer form, polyurethane foam, natural-rubber-silk rubber, urethane yarn rubber, Taira rubber, a heat shrink nature film, etc. are used, especially if it is an elastic material, it will not be limited. The circumference elasticity elastic body 7 of a foot can consider consisting of several lines which are not parallel to one line or mutual, or parallel, or considering as a straight line or a curve, and it should just arrange it so that a crotch may fit.

[0018] Moreover, as shown in drawing 3, the usage \*\*\*\* diaper of this invention has the solid gathers 8 formed near the edges on both sides of an absorber 3. In drawing 3, the part located in the absorber 3 side of a sideseat 6 branches from on the side flap 5 to the upper part, and the solid gathers 8 are formed. As the side edge in alignment with the longitudinal direction wraps in the solid gathers elasticity elastic body 15, it is bent. It is folded up, fold up and the section 12 is formed so that the free edge 11 may be formed and the staging area may project toward the outside of a diaper. Furthermore, the surface sheet 1 extends outside from the edges on both sides of an absorber 3, and the side edge section is joined to the folding section 12 of the solid gathers 8. Thereby, the solid gathers 8 used a part for jointing with the absorber 3 of the first set edge 9 and the surface sheet 1 as the second set edge 10 for the branch point on the side flap 5, bent to the typeface of \*\* and have stood up up so that the folding section 12 may be located outside the first set edge 9 and a free edge 11. Namely, as for near the lower part of the solid gathers 8, space 14 is formed with the surface sheet 1 and the sheet of two sheets of a sideseat 6. For this reason, from the solid gathers 8, the effectiveness of preventing excrement oozing out is raised and the thing of it can be carried out. Moreover, since excrement will enter, it will be held temporarily and it will be absorbed by the absorber 3 after that, the leakage prevention effectiveness can be further raised to the space 14 of solid gathers. Furthermore, since the solid gathers 8 support by the two end face sections, the solid gathers 8 fall and effectiveness is in prevention. As the fixed approach, as long as it is independent or the approaches that it does not separate even if it gets wet in urine etc. although there is an approach by such combination, such as an approach by hot melt adhesive, a heat-sealing joining method, and an ultrasonic welding method, which approach may be used.

[0019] Although the first set edge 9 of the solid gathers 8 should just exist on the side flap 5, it is desirable to be located from absorber 3 edge between the circumference elasticity elastic bodies 7 of a foot on the side flap 5. If the first set edge 9 exists in the location inside absorber 3 edge, an absorption field will become narrow and leakage will occur. In case a diaper is worn, the solid gathers 8 insert between a wearer's skin and the circumference elasticity elastic body 7 of a foot, are crowded, and stop moreover, playing the role of an anti-leak barrier. If the first set edge 9 is located outside the circumference elasticity elastic body 7 of a foot. As for the location of the second set edge 10, existing in the absorber 3 upper part is desirable. When the second set edge 10 exists in the outside of an absorber 3, the part in which an absorber 3 does not exist at all will exist in the pocket structure of the solid gathers 8. That is, when the urine and loose passage which were excreted so much stop at the solid gathers 8 and flow into an absorber 3 side along with the wall surface of the solid gathers 8, in the part in which an absorber 3 does not exist, neither urine nor a loose passage can be absorbed, but urine etc. collects in the shape of a pool in the part. At this time, if the child putting on a disposable diaper moves, leakage will occur.

[0020] Moreover, the solid gathers 8 have the free edge 11 other than the first set edge 9. A free edge 11 exists in the location which is formed in saccate and estranged the side edge section of a sideseat 6 in the surface sheet 1 by bending the solid gathers elasticity elastic body 15 so that it may wrap in inside. Although it will not be limited especially if it is an elastic material as a solid gathers elasticity elastic body 15, the material with which the same materials as the circumference elasticity elastic body 7 of a foot arranged in the side flap 5 also differ is sufficient. Moreover, it is desirable that may arrange several and at least one is not installed in the saccate parietal region of the solid gathers 8 at least. Anyway, the solid gathers elasticity elastic body 15 should just be arranged so that the solid gathers 8 can stand up firmly.

[0021] For the die length of the lengthwise direction of the free edge 11 of the solid gathers 8, it is [ side edge / of an absorber 3 ] more desirable not to arrange the solid gathers elasticity elastic body 15 in the length-from-the-crotch-to-the-cuff field at least in the free edge 11 of the lengthwise direction both-ends field 13 that what is necessary is just more than wrap die length. It is more desirable for the solid gathers 8 to have not stood up, since the free edge 11 of the lengthwise direction both-ends field 13 is a part equivalent to which an abdomen and regions of back are directly. When the solid gathers 8 stand up in an abdomen and a regions-of-back field, a feeling of wear will be extremely inferior. There should just be width of face of the clinch of the side edge section of the sideseat 6 which forms the free edge 11 more than the width of face that wraps the solid gathers elasticity elastic body 15 installed in inside.

[0022] The solid gathers 8 are folded up between the first set edge 9 and a free edge 11, and have the section 12. The location of the folding section 12 has the good inside [ location / where it is an outside from the edges-on-both-sides section of an absorber 3, and the circumference elasticity elastic body 7 of a foot on side flap 5 field is arranged ]. If the location of the folding section 12 consists of the edges-on-both-sides section of an absorber 3 inside, since the solid gathers 8 will cover and hang on an absorber 3 and an absorption field will become narrow, leakage occurs frequently. On the contrary, if the location of the folding section 12 becomes outside the location of the circumference elasticity elastic body 7 of a crotch on side flap 5 field, since the solid gathers 8 will be put between a wearer's skin and the circumference elasticity elastic body 7 of a foot at the time of wearing, leakage will occur, without the ability playing the role of the solid gathers 8. Although adhesion immobilization of the side edge section and the sideseat 6 of the surface sheet 1 is carried out in order to form the space 14 of solid gathers, as for the location at that time, it is desirable that it is the folding section 12. If a fixed position folds up and it exists in a free-end 11 side from the section 12, to the typeface of \*\*, the solid gathers 8 are stabilized and will not stand up.

[0023] In the lengthwise direction both-ends field 13 of a diaper, the solid gathers 8 which have the first set edge 9 arranged as mentioned above and the second set edge 10, a free edge 11, and the folding section 12 are attached, as shown in drawing 4. That is, it folds up from the first set edge 9, it extends in the direction of an outside of a diaper between the sections 12, and folds up further, and it is turned up in the direction of the inside of a diaper between the section 12 and a free edge 11, and after the solid gathers 8 have lain down on the top face of the body of a diaper, it is maintained. In the lengthwise direction both-ends field 13, the folding section 12 and a sideseat 6 are fixed and the free edge 11 and the surface sheet 1 are being fixed further.

[0024] Moreover, the central field of the solid gathers 8 which hit the length-from-the-crotch-to-the-cuff section stands up according to the shrinkage force of the solid gathers elasticity elastic body 15 attached in the free edge 11, as shown in drawing 3. Since the solid gathers 8 fold up with the first set edge 9, extend on the outside of a diaper between the sections 12, fold up further and are turned up in the direction of the inside of a diaper between the section 12 and a free edge 11 at this time, the standing-up direction of the solid gathers 8 once stood up in the direction of an outside from the first set edge 9, was folded up further and has stood up in the direction of the inside from the

section 12. That is, the solid gathers 8 have stood up from the first set edge 9 to the typeface of \*\*, will form the pocket structure where capacity is large, and can raise greatest effectiveness to leakage prevention rather than it pushes down the solid gathers 8 inside simply. [0025] The width of face of the solid gathers 8, i.e., the width of face of the first set edge 9 and a free edge 11, is 3cm - 5cm preferably 1cm - 7cm. The standing-up height of the solid gathers 8 becomes it low that the width of face of the solid gathers 8 is less than 1cm too much, and leakproofness is spoiled. Conversely, if 7cm is exceeded, the standing-up height of the solid gathers 8 will become high too much, it becomes that it inserts and is easy to be crowded between a wearer's skin and the circumference elasticity elastic body 7 of a foot at the time of diaper wear, equipping becomes poor as a result, and little urine will also leak.

[0026] As for sideseat 6 part which forms the solid gathers 8, it is desirable that it is water repellence in order to play the role of \*\*\*\*. As for surface sheet 1 part which forms the solid gathers 8 on the other hand, it is desirable that they are a hydrophilic property or water permeability. When excrement enters the space 14 of solid gathers, after it holds temporarily and being dammed up by the sideseat 6, it will be absorbed by the absorber and a leakproof effect will be demonstrated further.

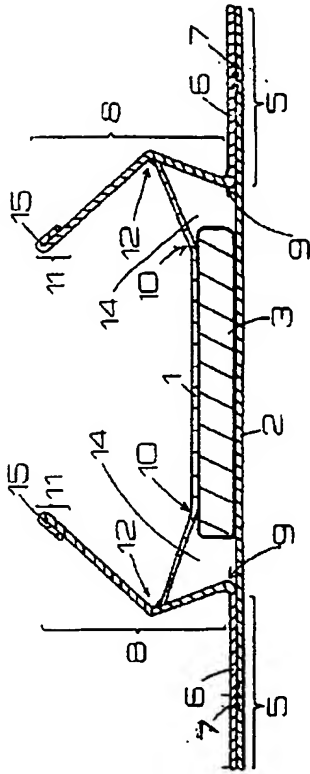
[0027]

[Effect of the Invention] The diaper of this invention demonstrates the effectiveness of preventing leakage, in order that solid gathers may function as an anti-leak barrier with height and may form the pocket structure where capacity is large, even if it has the two end face sections on a sideseat and an absorber, it has the solid gathers of the configuration which bent to the typeface of \*\* so that it may project toward the outside in bonito Mutsu, and a lot of urine and loose passages are excrete at a stretch. Moreover, near the solid gathers lower part cancels the trouble of not standing up while it not only demonstrates effectiveness, but it oozed out and solid gathers had fallen on prevention, leakage or in order to form space with the sheet of two sheets.

[0028]

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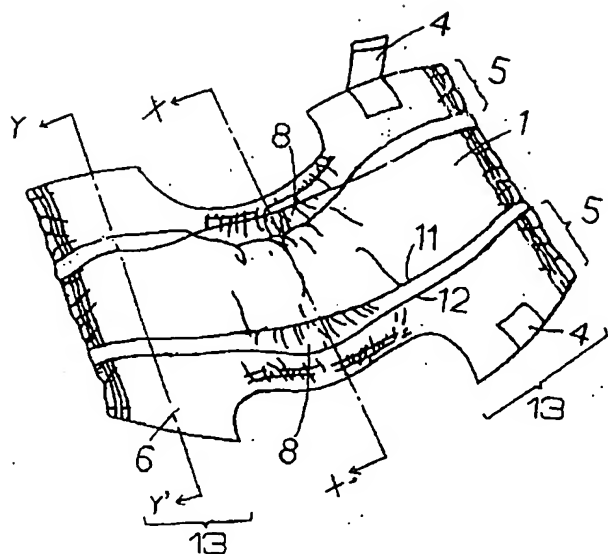
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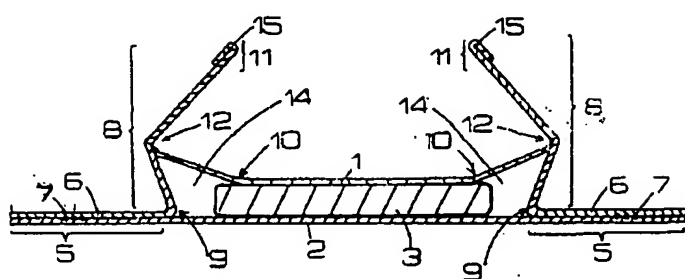


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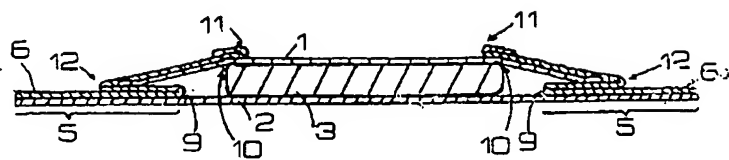
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